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**SAUNDERS
ON
THE TEETH.**

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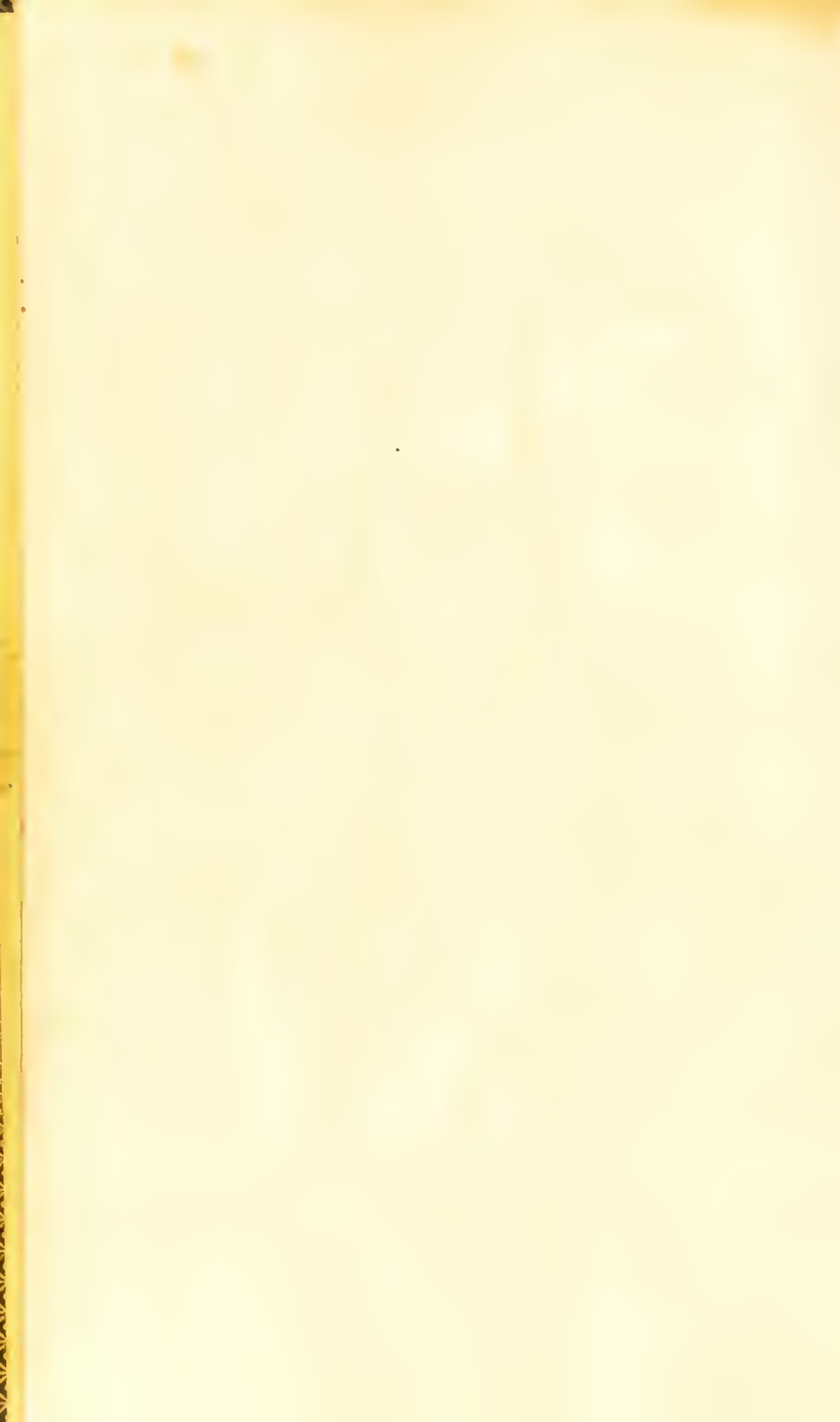
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ADVICE

ON THE

CARE OF THE TEETH

BY

EDWIN SAUNDERS, DENTIST,

FELLOW OF THE MEDICO-BOTANICAL SOCIETY,

LECTURER ON THE ANATOMY, PHYSIOLOGY, AND DISEASES OF THE TEETH.

AUTHOR OF "THE TEETH A TEST OF AGE," ETC.

Fourteenth Thousand

LONDON

THOMAS WARD & CO, PATERNOSTER ROW

AND TO BE HAD OF

THE AUTHOR, 16, ARGYLL STREET, REGENT STREET

1837



Portrait in the Color G. BAXTER, Pat. No. 3, Charterhouse Square.

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T. C. Savill, Printer, 107, St. Martin's Lane, Charing Cross.

TO
SAMUEL CARTWRIGHT, ESQ.,

&c. &c. &c.

Whose Talents have so long shed a lustre over that
department of the Medical Profession
to which it refers,

THIS LITTLE WORK

Is,

(By permission.)

With the profoundest sentiments of esteem and
gratitude,

D E D I C A T E D,

By his

Very obliged, and faithfully,

THE AUTHOR.



PREFACE.

THE sale of eleven thousand copies in this country* alone, in little more than four years, with few of the ordinary aids which are employed in such cases, with the flattering testimonials to its usefulness which have been received from professional and other persons in the upper and middle ranks of life, seconded as they were by the unanimous and unequivocal approbation of the public press, render

* It has also been reprinted in France, Germany, and America, and has circulated extensively in each of those countries. The author has been consulted by persons from all parts of the continent of Europe, from America, from the East and West Indies, and, in more than one instance, from China, who had become acquainted with him through this little work in those parts of the world. He has also been informed that an edition in French has appeared, and that another is in progress, or published, in German.

it imperative on the author, in preparing a new edition of this little work,* to omit no care or exertion which shall increase its utility and enhance its value. With this conviction, the whole has undergone a careful revision; many subjects which, from the confined limits of the former editions, were imperfectly, or too succinctly treated, have now obtained a more extended consideration; others which, for similar reasons, were altogether omitted, are now for the first time introduced, while the merits of those remedies or preparations, which, from their recent introduction, were regarded as in some degree uncertain and problematical, are now, from a more ample experience, more fully and satisfactorily discussed. With these improvements, however, it is hoped that the main features of the original work will be recognised, that in its new form it will have

* Which formerly passed under the title of "Five Minutes' Advice on the Care of the Teeth."

lost nothing of its practical utility, and that it will still exhibit, the same familiarity of style, divested of all technical detail and phraseology, by which it was originally characterized.

It will be found that the author has occasionally referred to his Lectures on the Anatomy, Physiology, and Pathology of the Teeth, delivered at St. Thomas's Hospital. No apology will, it is hoped, be deemed necessary for this, since the extracts so introduced appeared to afford a more familiar illustration of the subjects referred to than could perhaps otherwise have been given.

It is well known that a degree of delicacy and sensibility is felt on the subject of the Teeth, sufficient to prevent advice from being given, even where there may be the sincerest desire and the greatest necessity for doing so, and this frequently operates between the most intimate friends; in such cases, it is hoped that this little work will be found useful. A recommendation to peruse it, on

which no hesitation could be felt, may lead to a consideration of the subject, and ultimately be productive of those advantages which could scarcely have been obtained in any other way. The author has the satisfaction of knowing that this intention was amply fulfilled in the former Editions, and that it has been extensively employed for this purpose, even by Dentists themselves. He trusts, therefore, that in its present form it will be found a not less valuable auxiliary in such cases.

Those who, from experience or otherwise, are convinced of the value and importance of the Teeth, and of the necessity of an early attention to what is conducive to their preservation, and who will therefore be anxious that just notions respecting their economy and treatment should be possessed by the young, in whose welfare they are interested, will, it is confidently hoped, find the following work adapted to the purpose.

The design of this little treatise being, not

to establish any partieular views, or the excellence of any peeuliar mode of treatment, but simply to convey, in as eoncise and clear a manner as possible, correct and useful information upon a subject on which considerable misapprehension prevails, it is again committed to that distinguished patronage which it has so long enjoyed. And if it shall have corrected erroneous notions, or imparted salutary adviee, so as in any degree to have arrested the progress of empiricism,—if it shall have rescued any from being deluded by the mendacious statements which daily offend the common sense and good taste of the publie, and which owe all their temporary influence to the power of iteration, the object contemplated by the author will have been aecomplished, and he will feel himself amply compensated for any labour he may have bestowed in its preparation.

EXPLANATION OF THE ENGRAVING.

THE accompanying diagram is designed to exhibit a view of what is a frequent subject of inquiry,—viz., the manner in which the nerves, the organs of sensation, are distributed to the teeth.

Nothing can be more beautiful than the manner in which these organs are supplied with nervous sensibility. Extremely fine nervous filaments, (which in this diagram are represented much larger than they naturally appear, in order to render them distinctly visible,) may be seen entering the extremity of each root of each tooth. Having passed into the tooth in this manner, they expand, and disperse themselves over a pulpy substance, which is lodged in a cavity in the centre of these organs, varying in each according to its form and size. These fine

nervous filaments, however, have all one common origin; they all spring from the larger nerve which lies protected from injury in a channel excavated for it in the very substance of the bone. Traced still further back, these larger nerves, of both the upper and lower row of teeth, unite, and arise from a common source, along with numerous other and most important branches (which in this dissection have been removed to prevent confusion), from the facial or fifth pair of nerves.

This will explain those exquisite and apparently anomalous sympathies which are sometimes experienced under affections of the teeth. It is no uncommon circumstance in cases of tooth-ache for the pain produced by a diseased condition of one of these organs, to be referred to another which is healthy and sound, or to the corresponding teeth in the opposite row.

Not a few teeth have been unnecessarily sacrificed, entailing upon the individual all the injurious consequences of the early or premature loss of these organs from a want of acquaintance with this subject. The manner in which the nerves are distributed

to the teeth has not been understood, and the pain has been considered too local and too unequivocal to be merely sympathetic, and the tooth, though sound, or affected only in the most trifling degree, has been removed. Again, it not unfrequently happens with those situated in the back part of the mouth, especially in the lower row, that a diseased tooth will produce pain in the ear. This will be easily comprehended when it is understood that the same nerve that communicates sensibility to one tooth communicates sensibility to all, and that, along with numerous others, it sends off a small branch which runs to the ear.

By a similar arrangement, and following a similar route, the teeth are supplied with blood-vessels for the purposes of nutrition and growth. So that through the minute opening which exists at the end of the root of the tooth, there pass, not only a nerve, but a vein and artery, by which the vital fluid is received into and returned from the tooth with every contraction of the heart or beat of the pulse.

A more beautiful instance of minute and

exquisite mechanism could scarcely be found in the whole human frame. The end of the root of a tooth presents an opening so small, that it can scarcely be traced with the point of the finest needle, and yet through this pass not only the blood running in two contrary currents, being carried from the heart by the artery into the very substance of the tooth, from whence it is again collected and returned by the vein, but also a nerve of most delicate structure and most exquisite sensibility. And in this microscopical tube there must not only be sufficient space to allow of the muscular contraction (producing the pulsation) of the artery, so as not to impede the return of the blood by the vein, but also to avoid making pressure upon the nerve.

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ADVICE

ON

THE CARE OF THE TEETH.

FROM what innumerable and unsuspected sources is the stream of human happiness supplied, and by what apparently trivial circumstances is it arrested ! A single grain of sand in the eye, or the most trifling injury or exposure of the fine nervous thread which is found in the centre of a tooth, is sufficient to suspend all our ordinary occupations and pursuits.

Probably there are no parts of the human structure in which this is more strikingly exemplified than in the organs under consideration. What malady is so prevailing, so

excruciating and intolerable in its character, or which so completely incapacitates the individual for every species of intellectual or physical exertion, as the Tooth-ache; and yet, what appears more trivial, or obtains less of the sympathy of others? How desirable, then, does it become, that correct and useful information should be possessed upon a subject of such deep and general concern.

The important relations which these organs sustain to the health and comfort of the individual, and the distressing effects of their neglect, resulting in their ultimate loss, after a tedious interval of painful and debilitating affections, would, it might be supposed, obtain for the Teeth a prompt and general attention. Such is, however, far from being the case, even in those classes of society where it might be expected with the utmost confidence. It is still true, in a vast majority of instances, that the Teeth remain disregarded until they urge their claim with an appeal to the feelings too strong to be any longer resisted. Thus the remedial rather than the preventive

treatment becomes necessary, and the result is rendered more or less precarious by delay.

Many persons who possess these organs in fine condition, and who have hitherto been strangers to the maladies to which they are so commonly subject, seem to presume upon their very perfection, and to make it a plea for their total disregard, subjecting them to all kinds of severe and unnatural action, to their ultimate and permanent deterioration. This arises from an erroneous view of their economy and structure. Their vitality, and the intimate communication which they maintain with the system, by means of a complete set of nerves and bloodvessels for their nourishment and preservation, is overlooked, or not understood, and they are regarded as something too hardy and insensible to sustain any injury from treatment, however violent, or neglect, however protracted or complete. But this is a course which, sooner or later, in proportion as it is a violation of the laws of nature, the individual is painfully convinced

cannot be persisted in with impunity. One after another of these hitherto impregnable organs at length begins to exhibit signs of decomposition and disease, and all their beauty and strength are succeeded by deformity and pain. Cases of this kind are by no means of such rare occurrence as to render observations of this nature unnecessary. Instances are not unfrequent of a fine set of teeth being prematurely lost from a want of that ordinary care and attention which are accorded to other parts.

The evils, however, resulting from this general inattention to the subject, are not simply of a negative kind. In all cases in which an opinion, or a course of action, must be adopted on the moment, without previous inquiry and consideration, the most injurious errors may be committed. This is eminently true of every department of the medical profession, but of none more so than of that which forms the subject of the following observations. We felicitate ourselves upon the progress of intelligence and the superior

penetration which enable us to detect the impostures, and smile at the credulity, of a former age, while we are ourselves the victims of delusions equally monstrous or absurd, though disguised under new forms, and appearing in different circumstances. There have never been wanting men of sordid minds ready to apply themselves to whatever subject is imperfectly understood, and on which little general information prevails, as affording an opportunity of practising upon public confidence. The scientific and honourable practitioner, however, desires nothing less, than that his patient should possess sufficient general information to enable him clearly to comprehend his own case and the proposed means of relief. In the absence of this, there is not only much danger of neglect, but of the adoption of improper treatment when remedial measures shall have become necessary.

VALUE AND IMPORTANCE OF THE TEETH.

The Teeth possess a most important influence in the form and expression of the counte-

nance. Whatever may be the regularity and perfection of the features generally, if the mouth is irregular or unpleasing, a disagreeable impression is momentarily produced. On the contrary, where the outline of this feature is good, and the expression happy, there is a fascinating power present which seems to arrest all further analysis of the countenance. Not to attribute too much to the teeth in this matter, it is certain that, independently of the disagreeable effect produced by an ill-arranged or diseased condition of these organs, they also materially influence the form and expression of the lips, which fall like a beautiful drapery around them, enhancing their lustre by the pleasing contrast of the crimson and white. But this is not all.

There are three conformations of the mouth, two of which must be considered as departures from the line of beauty, all resulting from the position and arrangement of the teeth.

In the first, or natural and perfect, conformation, the teeth of the upper row occupy the segment of a larger circle, and fall over

those of the lower row so as partially to conceal them when the mouth is closed. This is more observable in the front teeth, but it may be traced through the entire series. The advantages of this conformation are many, and obvious. It subdues the lower part of the countenance, and produces that oval form which is a distinctive and palpable characteristic of beauty. It gives a proper protuberance to the mouth, and allows the free play of the lips ; and thus, if it does not impart expression, it renders it still more vivid and pleasing. By the great freedom of expansion of the palate which it allows, it renders the voice full, and the articulation clear and distinct. Lastly, this arrangement is the best adapted for mastication, and for the preservation and durability of the teeth themselves.

In the second, the two rows of teeth are of equal expansion, and meet upon each other. Among the disadvantages attending this conformation, are the continual abrasion to which they are subjected by the contact of their

edges. The front teeth become rapidly worn down, and assume a short and stunted appearance, and their edges are broken and uneven ; the fulness of the upper lip is not properly maintained, and the depth of the lower part of the countenance is contracted. The tongue no longer impinging against the thin edges of the upper front teeth, the articulation is more or less imperfect and indistinct. Mastication is inadequately performed, from the flatness and evenness of the grinding surfaces of the teeth, the result of the obliteration of those prominences and inequalities which naturally exist. In addition to this, the teeth become more or less tender in proportion as they are worn away.

In the third conformation, the upper row of teeth occupies the segment of a *smaller* circle, and is received within the lower. The disadvantages of this arrangement are more numerous and striking than in the last. It produces an ungraceful protrusion of the chin, and gives an undue prominence to the lower part of the countenance.

The free development of the lower lip which it causes, imparts an appearance of deformity and distortion to the mouth, both in speaking and when it is closed. The contraction of the upper row of teeth, and their inward inclination, by allowing a too free and continual contact of the tongue with their edges, renders the articulation very imperfect. The inconveniences in mastication are not less serious. Seeing, then, how much depends upon a happy arrangement and conformation of these organs, it is consolatory to know that this may be secured in any case by due and timely attention. But this subject will be again alluded to when speaking of irregularity.

Thus, then, it appears, that much of the expression and beauty of the lower half of the countenance depend upon a proper disposition and arrangement of the teeth. But it may be asked, why attribute that to the teeth which seems to result rather from the size and form of the bones of the face, to which the teeth are attached? Because the teeth evidently take precedence in the order of nature.

They are essentially the organs of articulation and mastication, and, admirably adapted as they are to these purposes, they are not modelled without regard to beauty and elegance of form and colour. The teeth are therefore the important organs, and are implanted in the maxillary bones, which are only subservient to them for the purposes of nutrition and support. They stand in the relation of contained and containing parts ; and the latter are as obviously designed for the protection and support of the teeth as the skull is for the brain. The fact of the removal of a great portion of their substance, by absorption, when the teeth are lost, and of their following the latter when, by accident or art, they are made to assume an altered position, sufficiently evinces their subservient and dependent character.

It is not, then, asserting too much for the teeth, or giving them an undue importance, to refer the expression and beauty of the lower half of the countenance to their influence. Viewed in another aspect, the same fact will

appear, and with additional confirmation. If a comparison be made between the youthful and the aged countenance, it will be found that the principal differences exist in the region of the mouth, and that almost all other changes result, directly or indirectly, from the alterations which it has undergone.

What are the more prominent characteristics of old age as indicated by the countenance? The approximation of the nose and chin, the hollow and shrunken cheeks, the thin and contracted lip—all the direct result of the loss of that support which the teeth are destined to afford; of these, the contraction of the space between the nose and chin is undoubtedly the most striking, and probably no part of the human frame could furnish a parallel to it, since it comprises not only the loss of the teeth, but of almost their entire sockets, making a difference in the length of the countenance of an inch, or an inch and a half. This, however, is a picture now rarely to be met with in the middle and upper classes of society, where the art of the dentist is in exer-

cise. Those distressingly fine old ruins of “the human face divine” which were familiar in the last century, are now seldom seen ; it may, indeed, almost be said of the present generation, that there is no old age,—so perfect and so generally available are the resources and assistance of art.

But the teeth are not only indispensable to *personal beauty* ; on them also depends, to a degree perhaps altogether unsuspected, the perfection of *utterance* and *articulation*. How far the voice itself may be affected by the loss of teeth, from the less perfect resonance allowed by the diminished vault of the palate, it may be difficult with precision to determine. The loss of the teeth undoubtedly contributes much towards that feebleness of voice which belongs alike to infancy and old age. It may be observed that this results in the one case from the imperfect development, and in the other from the impaired condition, of the parts more immediately concerned in the production of sound. This is true ; but as the development of both is consentaneous, and as a

contraction of the muscles of the face and throat is known to follow the loss of the teeth at any period of life, it may be difficult to shew that a prematurely impaired condition of the organs of voice may not be induced by a similar cause. That much depends upon the due expansion and depth of the palate there can be no doubt; and of this vocalists and persons accustomed to appreciate minute differences of sound seem to be in some instances aware. I have been more than once consulted on this subject by distinguished professors of that art when the deficiency has been but trifling: in one case, the loss occurred in a molar tooth of the upper, and in another in two molar teeth of the lower row. These deficiencies occurring at the back of the mouth, would, by an ordinary observer, have been passed over as too remote to produce any effect. In both instances, however, the individuals were convinced that an alteration in the tone and pitch of the voice was the consequence, which was remedied by filling up the vacant space. Whether this could have been occasioned by the trans-

mission of currents of air through the vacant spaces, thus rendering the reverberation in the palate incomplete, or whether it was the result of relaxation, is an interesting inquiry, which, however, must be reserved for future investigation.

It is an interesting fact, that the child makes no attempt at articulation until it has acquired several of its teeth ; and it is well known that this faculty again becomes exceedingly imperfect during the process of changing them, from which time it continues to improve until it is again permanently impaired in old age, when they are finally lost. Nothing could more beautifully and eloquently point out one of the most important uses of these organs. Here is a faculty peculiar to man, and intimately connected with his intellectual and social happiness, the entire history of which is blended with that of a set of organs which seem necessary to its exercise, and, indeed, almost to its existence.

The sibillation, or lisping, which results from the loss of one of these organs in the

front of the mouth, plainly and forcibly indicates the importance of the integrity of the series; and the abrupt and imperfect enunciation produced by a supernumerary or irregular tooth, sufficiently evinces the value of regularity of arrangement and position.* There are, indeed, some of the consonants, termed “dentals,” to the enunciation of which the teeth are especially important: these are, t, d, s, z, and j, to which may be added the diphthong th. It is quite obvious, however, that, although in these cases they may seem to have a peculiar value, they are more or less necessary in all. But perhaps the most striking and convincing proof of the value and

* Public speakers have not generally paid sufficient attention to this subject. It is not uncommon to hear an otherwise fine and effective elocution marred and impeded by some irregularity of arrangement or position of the teeth. Habit may so far have familiarized the individual with the defect that he may be unconscious, and even in some degree enamoured, of it. It should never be forgotten, however, that such a defect must ever prove an impediment and a source of annoyance to an indiscriminate and unfamiliar audience. Cases of this kind are not without remedy. Supposing more gentle measures to be ineffectual, the offending tooth may at any time be removed and replaced in a regular and more advantageous position.

importance of the teeth to distinct and perfect articulation will present itself in the case of persons who in the early or middle periods of life have become deprived of the whole of their teeth ; nor is this, unfortunately, of such rare occurrence as to be considered inaccessible evidence. In such cases, the organs of voice may be perfect,—the tongue may possess the utmost freedom of motion, and all the parts which concur to the enunciation of language may be unimpaired,—and yet, until artificial teeth restore to them the office of the absent organs, intelligible articulation is almost impossible.*

* Wolfgang Kemplin, who invented that very ingenious deception, the Automaton Chess-Player, which seems for a time to have puzzled all the philosophers and mathematicians of Europe, constructed a speaking automaton, in which he ultimately succeeded so far as to make it pronounce several sentences, among the best of which were—“ Romanorum imperator semper Augustus ;” “ Leopoldus secundus ;” “ Vous êtes mon ami ;” “ Je vous aime de tout mon cœur.” It was some years, however, before he could accomplish more than the simple utterance of the sounds o, ou, and e. Year after year, we are told, was devoted to this machine, but i or u, or any of the consonants, refused to obey his summons. At length, he added, at the open extremity of the vocal tube, an apparatus similar in action

How far stammering and original defective utterance may depend upon normality of development in the teeth may perhaps admit of a question. It would undoubtedly be rash to assert that in no cases this is produced by mechanical causes ; it may, however, be fairly doubted whether stammering is not more generally occasioned by a want of regular or contemporaneous action between the brain, nerves, and muscles, acting upon the organs of voice. Mechanical impediments, however, should undoubtedly be removed or prevented, in all such cases, with the utmost care and promptitude.

and construction to the human mouth, with its teeth, when he quickly succeeded in making it not only pronounce the consonants, but words, and even the sentences quoted above. He had previously imitated the tongue and its actions. This fact is interesting, not only as a rare instance of human ingenuity, (for if not the first, it was probably the most perfect instrument of the kind that had then been constructed,) but also as exhibiting in a most striking light the beautiful adaptation of parts to their respective functions, and that so perfect are the contrivances in nature for particular ends, that, in order to arrive at anything like an imitation of those functions, we must follow closely the method she employs.

But there is another and still more important aspect in which the teeth claim to be regarded, and that is, their office in the function of *digestion*. The situation in which they are found, being placed at the very commencement of the alimentary apparatus, the regular gradation in their forms and size, and their relative position with respect to each other, sufficiently indicate this to be their primary and most important use. A comparison of the human teeth with those of the lower animals—in which, with the exception of an occasional development of some as weapons of attack or defence, mastication must be considered their sole function—will exhibit this in a still more striking light.

Man has been pronounced an epitome of the universe ; and, however true this may be of him in his physiological character generally, it is nowhere more beautifully displayed than in the economy of the teeth. Here he exhibits, as it were, a synopsis of creation. In him are displayed all the contrivances of nature for particular cases and circumstances, in

a modified, refined, and more perfect condition ; so that the extreme development of certain classes of teeth in some animals makes them appear so many deviations from their types in the human species, which constitute the standard of beauty. Thus, the incisor, or front teeth, in man, hold an intermediate rank between their very free development in the graminivorous tribes, and their irregularly-formed types in the carnivorous animals, and they are far more exquisitely modelled than either. The molar or grinding teeth differ not less from the sharp, bold lacerator of the carnivorous, than from the smooth triturator of the graminivorous tribes, and possess a far more beautiful form than both. Lastly, the cuspid or canine tooth in man—unlike the graminivorous tribes, where, as it would be useless and inconvenient, it is wholly wanting,—is present, but, without losing its distinctive character, is subdued and modified. Thus, as he is omnivorous in his appetites, and has the free range of creation before him, so, in the apparatus by which he assimilates to him-

self substances of different structure and qualities, all the various contrivances which are adapted to these are collected, modified, and rendered still more beautiful. A similar remark may be made respecting the position of the human teeth, as influencing the conformation of the mouth. One of the most distinguishing features of the human countenance is the prominent chin, and this is mainly due to the perpendicular position of the teeth. How much of the grace and fascination of the smile, of which the human mouth alone is susceptible, may depend upon this, has perhaps never been sufficiently considered.

One of the most beautiful and interesting contrivances to supply the action of the teeth where their presence would have been inconvenient, is exhibited in the gizzard of granivorous birds. This consists of two dense masses of muscular substance, so situated in the alimentary canal that the food in its course must pass between them. But a muscular body, however dense, or however powerful its action, could ill perform the

office of teeth in dividing or crushing grain. These are therefore furnished with small sharp stones, which the bird may be seen continually swallowing with its food, and apparently to the same extent. These, then, being inserted into the substance of the gizzard, render its surface sufficiently rough to effect a complete comminution of the food. An inattention to this circumstance has, doubtless, caused the death of not a few pet birds. The sand or gravel on the floor of the cage has been so finely sifted and strewn, that the poor little sufferer, being deprived of those small angular pebbles which constitute *his teeth*, has gradually drooped and died—the *victim of indigestion*.

The primary and most important use of the teeth, then, is mastication, or the minute division and comminution of the food preparatory to its being received into the stomach. It includes, however, more than this. By the action of the mouth during this process, the saliva, a bland alkaline fluid provided for this purpose, is poured out in

considerable quantity, and becomes intimately mixed with the food ; so that, along with the comminution, it undergoes a process of maceration. Thus, mastication has been, not inaptly, termed by some physiologists, the first process of digestion.

The irritable, feverish, ill-at-ease sensations consequent upon a hasty and imperfectly-masticated meal, sufficiently indicate the importance of the due performance of this first or preparatory process. When, however, the *apparatus* by which this is effected is impaired, and inadequate to its function, these evils assume a more aggravated and accumulated form, resulting not unfrequently in permanent debility and depression of mind. Dr. Combe, of Edinburgh,* has observed on this subject — “ When unmasticated food is introduced into the stomach, the gastric juice acts only on its surface, and other purely chemical changes take place in its substance before

* “ Essay on Diet and Regimen.”

its digestion can be effected. Hence often arise, especially in children, those pains and troubles, that nausea and acidity, consequent on the continued presence of undigested aliment in the stomach. . . . Hence another proof of the importance of slow and deliberate mastication." In the experiments which Dr. Beaumont had so rare an opportunity of conducting on Alexis St. Martin, an individual in whom a portion of the stomach had been removed by a musket-shot, thus allowing an opportunity of observing the process of digestion, considerable attention was paid to this subject, and the result was such as fully to corroborate this opinion. It was constantly found, that in order to the production of good chyme, (the condition to which the aliment is reduced in the stomach,) the food must be introduced in a finely-divided and macerated state. For the gastric juice appears to produce changes, first upon the *surface* of a particle of food ; then by the action of the stomach, the chyme thus formed becomes removed, and the under sur-

face exposed, which, in its turn, becomes acted upon, and is again removed. But as the energy of the digestive function diminishes, every successive action of this kind is more feeble than that which preceded it, and, after a certain time, the remaining aliment ceases to be acted upon, and passes forward in a crude state. Thus it will be seen of how much importance it is that the food should be well divided, so that the gastric juice may come into contact with it by as many surfaces as possible at once.

How great, then, are the value and importance of the teeth, whether regarded as the foundation or support of the countenance,—imparting beauty and expression to the features, and by their forms and colour producing an agreeable contrast to the eye—contributing, in no inconsiderable degree, to the perfection of the voice and articulation,—or as the organs of mastication, without which the comforts of life must fail, the mind be depressed, and the whole system fall into premature decay! What stronger or more

urgent considerations could be required to induce a determined and prompt attention to the

PRESERVATION OF THE TEETH.

Attention to the preservation of the teeth cannot be commenced too early. Children should be taught to make it a part of their daily ablution, and those who have grown up in the neglect of it, should immediately resolve no longer to delay attending to it.

It should always be remembered, that as nothing is more easy than to contract a habit of neglecting the teeth, (which is often done almost unconsciously,) so nothing is more easy than to overcome such a habit. A simple rule laid down, and adhered to, of attending to them every day for a fortnight, would, in most cases, prove sufficient; and when once they have been restored to a proper state, the comfort such a practice would afford would effectually prevent its being on any after occasion omitted.

Many persons who have not been in the habit of attending to their teeth, and who have been long accustomed to see them discoloured, are apt to imagine they have become injured beyond recovery: this is, in many cases, an entirely erroneous idea. It is not the *surface* of their teeth which they have been accustomed to see, but a concretion which is constantly forming, and which, from its having been suffered to accumulate, has, to a great degree, *concealed* the teeth; when this is once removed, which may be easily done, the teeth will immediately be seen in a greatly improved state, and of their natural colour.

And here it may be proper to remark on the practice of those who seem to have contracted a determined habit of neglecting their teeth, and who appear, if indeed they think at all on the subject, to consider the state of their teeth as not in any manner influencing their personal appearance; whereas every one who is accustomed to observe, must feel convinced that there is scarcely a greater

personal recommendation than clean teeth, and scarcely an occasion of more universal and involuntary aversion than the contrary.*

Did such persons, however, perceive the natural consequences of such neglect, they would, in all probability, speedily adopt an opposite course. They are these:—first, extensive inflammation, indicating the unhealthy state of the mouth generally; and, secondly, a gradual loosening of the teeth, which frequently issues in the successive loss of the whole of them; the accumulation insinuating itself by degrees between the teeth and the

* On this subject a distinguished writer makes the following observations:—"When the disgusting effects of this accumulation are considered, it would appear impossible that any persuasion could be necessary to induce persons to obviate so great a nuisance, even on their own account; or if they are too debased to procure their own comfort and cleanliness at the expense of a very little care and trouble, they surely have no right to shock the senses of others who possess more delicacy and propriety of feeling than themselves. Yet so it is; and the sight and the smell are alike constantly outraged by the filthiness of people who seem to obtrude their faces the closer in proportion to the disgust which they occasion."—*Bell's Lectures*, p. 199.

gums, and thus destroying that connexion which is necessary to their support. In such cases, what is called

SCALING THE TEETH

becomes indispensably necessary. Whenever this concretion has been suffered to accumulate—and it will be found in most cases where the regular cleaning of the teeth has been omitted—scaling the teeth should be immediately, and in the first instance, resorted to. It will be in vain to expect that without this any cleaning can bring back the teeth to a proper state; but with it the best results may be expected. Many persons, from their extreme sensitiveness, are reluctant to adopt this method, and, entirely from the fear of having to undergo what they have been accustomed to consider an operation, continue to deprive themselves of the comfort it is calculated to afford, and to incur the hazard of becoming almost toothless at a comparatively early age. This is a totally groundless

fear : the cleaning the teeth with instruments adapted to the purpose, if skilfully performed, need occasion no pain which the most delicate person would in the least regard, and will afford immediate and permanent pleasure ; so much so, that those who have once experienced it will need no argument to induce them to have a periodical recourse to the operation, should it become necessary. It will, however, require professional aid, and care should be taken in removing it not to injure the enamel.

With respect to the best means of preventing, at least to anything like the same extent, a recurrence of this accumulation, these appear to consist in constant attention to some simple circumstances, such as the use of the brush once, or, which is better, twice in the day, morning and evening, which soon becomes a grateful and refreshing habit, producing an agreeable sensation of healthfulness in the mouth, and enhancing the brilliancy and lustre of the teeth.

We not unfrequently, however, hear per-

sons complain, that although they are most assiduous and unremitting in their ablutions, and even use a hard brush, yet the tartar continues to accumulate upon their teeth. This, making adequate deductions for constitutional peculiarities, would appear to arise from due attention not having been paid to the proper selection of brushes, or to the proper mode of using them. Perhaps more depends upon the manner in which the brush, is applied, than is generally suspected; and next in importance is the construction of the brush itself. The ordinary method of using the brush, transversely, will appear, from a moment's consideration, to be quite ineffectual for the purpose intended: it would simply carry the tartar from the surfaces into the interstices and necks of the teeth, besides wounding the intermediate portions of the gum. This latter is an effect which it has been attempted to obviate by making the extremities of the bristles terminate in a rounded form; but this, so far as the removal of the tartar from the

teeth is concerned, which is the principal use and intention of a brush, leaves the matter worse than it found it. The fact is, that this operation, from its very simplicity, has never been properly attended to: if the forms and positions of the teeth had been at all regarded, a contrary direction would have immediately suggested itself; the brush, instead of being carried from side to side, would have been passed upwards and downwards, with a slight rotatory motion, so as to embrace the arched form of the enamel. But to accomplish this, the brushes must be made much thinner than they usually are, to allow of this vertical or perpendicular play. The brush which I have been in the habit of recommending, consists of only three rows of bristles, of a moderate hardness, the knots being somewhat spaced, by which arrangement sufficient play is allowed from its narrowness, and a degree of elasticity is gained, which allows the bristles to spring in between the teeth, and thus to free them from tartar where it has the greatest tendency to accumulate. This, combined with the palate-brush, adapted

to the inner surfaces of the teeth, and which for similar reasons should not be, as it usually is, of a rounded form, but square, and of a small size, is amply sufficient for ordinary purposes. A pointed brush is sometimes useful in keeping the crowns of the molar teeth clean; and if any are extensively decayed, their decomposition is very much retarded by its frequent use.

Dentifrices are extremely valuable, and are necessary, in a vast majority of instances, to the preservation of the teeth; they should, however, be employed with caution. Much mischief has arisen from the too ready adoption of *patent* preparations of this kind, the very statements of the *efficacy* of which should be sufficient to deter from their use.* As their action should be entirely mechanical, and that but slight, the levigated cuttle-fish,

* “ Many of the Tooth-Powders which are offered for sale with the promise of rendering the teeth beautifully white, perform for a time all that is promised, at the expense of permanent and irremediable injury to the teeth, for they often contain a quantity of tartaric or other acid, which effects a gradual decomposition of the enamel.”—

Bell's Lectures, p. 200.

or prepared chalk, might in many cases be sufficient. It is useful, however, and conducive to the health of the mouth, to combine with this some astringent or tonic preparation, as myrrh, or bark. A very useful tooth-powder where there is a great tendency to an accumulation of tartar, attended more or less with a lax state of the gums, is composed of equal parts of myrrh, bark, orris root, cuttle-fish, bole ammoniac, and dragon's blood. The dark colour of this preparation having been sometimes objected to, I have substituted quinine for the bark, and omitted the Armenian bole and dragon's blood. The recipe for this tooth-powder, which probably includes all that could be desired in such preparations, is as follows :

Prepared chalk	2 oz.
Cuttle-fish	1 oz.
Orris root	1 oz.
Powdered myrrh	$\frac{1}{2}$ oz.
Quinine	10 grs.

This may be delicately tinted with a little drop lake, and perfumed with any of the essential oils.

There are also tinctures for stimulating the gums, and rendering them firm and healthy, and diminishing tenderness and irritability. Alcohol is probably the principal agent in producing these effects. Among the best of them may be reckoned the Camphorated Spirits, Tincture of Myrrh and Bark, or the Myrrhated Eau de Cologne, which is a very elegant and pleasant preparation. It may be questioned, however, whether the habitual use of these is beneficial, except in cases where there are many loose or diseased teeth, and great tenderness and turgescence of the gums. When they are employed, their application should be combined with the free use of the brush on the teeth and gums, or occasional lancing.

With respect to the temperature of the water employed in ablutions of the mouth and teeth, it is sufficient to observe that, although the habitual application of warm water is injurious by inducing a relaxed state of the gums, and increasing the sensibility of the teeth, it should never be used so cold as to produce a

thrill or any unpleasant sensation. By establishing a practice of attending to these things, which should on no account be departed from, and having the teeth periodically examined, and freed from any little salivary concretion which may have occurred, everything will have been done that is necessary, or indeed possible, for the preservation of the teeth.

Of the diseases of the gums nothing has been said, because these are for the most part dependent upon the state of the teeth. The treatment of the ordinary affections to which this structure is liable is exceedingly simple. They are generally the result of the continued irritation of tartar, which, insinuating itself between the edge of the gum and the tooth, sets up a state of chronic inflammation, which may be alleviated indeed by repeated scarification, but can be remedied only by the removal of this concretion. When this has been done, the repeated use of a moderately hard brush will speedily restore them to a healthy condition, except in some rare

eases, in which the occasional use of the lancet may be necessary.

It is a great error to suppose that occasional bleeding of the gums is prejudicial; on the contrary, from the various degrees of temperature at which fluids are taken into the mouth, this is highly beneficial. A softer brush should never be substituted for the prevention of this; a contrary course ought rather to be adopted, since it should be regarded as a spontaneous effort of nature to relieve a lax or congested state of the vessels.

This laxity of the gums is almost invariably attended, sooner or later, with a loosening of the teeth and an absorption of their sockets, which occur in the following manner:—from indisposition or neglect, a line of tartar has been allowed to attach itself to the neck of the tooth. This, exciting inflammation in the edge of the gum, causes it to separate from the tooth, which it should closely surround. This separation allows a further deposition of tartar, which readily accumulates in the fur-

row formed by the thickened edge of the gum, and a further separation is the consequence. Absorption now takes place not only of the gum, but of the socket; and unless this series of processes is arrested, the newly-exposed root of the tooth becomes tender, its attachments are destroyed, and the tooth is speedily lost. Effectually to check this train of phenomena, every vestige of tartar must be carefully removed; a periodical recourse must be had to the lancet to relieve the turgid and congested state of the gums, and this must be followed by the use of some powerful astringent lotion. It is in such cases that the tinctures or lotions before referred to become valuable, and by their judicious use, with a moderately hard brush, and having the tartar removed every six, or even three months, teeth may be preserved for many years which may appear past all remedy. In many cases in which this course has been persevered in, I have known teeth retained for five and even seven years which would scarcely have been expected to remain

as many months. It is scarcely necessary to observe, that the only treatment to be pursued in cases in which the teeth become loose, is that which shall restore the mouth generally to a healthy condition. To effect this it will, in some instances, be necessary to restore those teeth which may have been lost, and in doing this an artificial support may be given to those which are loose ; but when this is not practicable, the attention must be directed exclusively to the treatment already pointed out. However strange it may seem, I believe that no better remedy will be found for a lax and tender state of the gums than the free use of the brush ; and while this is persevered in, these effects will rarely be experienced to a distressing degree. It may at first be painful, but it will ultimately be effectual.

DISEASES OF THE TEETH.

What are the cause and origin of decay in these organs ? is a question which is frequently asked, and to which the dentist is expected

to return a definite and intelligible reply. Yet there is, perhaps, no subject on which an opinion is given with more difficulty or hesitation; for although sufficient information may be elicited from the patient to enable him to discover the proximate or exciting cause in any particular case, it may appear of itself very vague and unsatisfactory, and wholly inadequate to the effect. And so, indeed, it is, if the more remote constitutional or predisposing causes be left out of view. These, however, from the early period of life at which the teeth are in process of formation, are altogether antecedent to the recollection of the individual. For although during the first seven years of a child's existence, the perceptive powers of the mind are in full and vigorous action, yet they are so absorbed by the number and variety of objects external to itself, as to leave it little leisure or disposition to contemplate its own structure and constitution, or the diseases and treatment to which it is made subject. But these occurring at the time of their for-

mation, exert a most important influence on the future health and durability of the teeth.

That very general and distressing disease of the teeth which is familiarly known by the terms caries or decay, may be referred to two distinct sets of causes, one of which may be termed constitutional or predisposing, and the other, developing or exciting causes. Under the former are included all those hereditary predispositions to disease which may be sometimes observed in a certain tooth, or class of teeth, in certain members of a family. Cases are occasionally met with, and they are amongst the most intractable which the dentist has to encounter, and not unfrequently baffle his utmost skill, in which disease appears in the same part of the same tooth, at a similar period of life in all the individuals of a family who resemble the parent in whom the defect originally existed. A remarkable case of this kind has occurred in my own practice, in which four of seven individuals of one family, all bearing a striking resemblance to each other, have the lateral

incisor (the outermost of the four front teeth) on the right side, in a more or less advanced state of decay. The disease makes its appearance at the adult age in the same spot, and although different treatment has been sought for each, they seem all about to share the same fate. This organ, in the youngest, who is now under my care, will, I have much reason to fear, notwithstanding the utmost pains and attention, ultimately share the common destiny. These, then, are cases in which the constitutional or predisposing cause appears sufficient of itself, and requires only time for its development. These organs are also predisposed to disease, from interruptions and commotions in the system occurring during their formation. Of this class are all those ailments and affections which make up the catalogue of infantile diseases, and which, by producing an irregular or vitiated condition of the secretions, interfere, more or less, with the proper action of the parts concerned in the production or formation of the teeth. For although it is

probable, as I have elsewhere observed,* that the process of the formation of the teeth is never, during any constitutional disturbance, entirely suspended, yet the parts formed during such periods are imperfect, and less capable of resisting morbid influences. Hence the irregular and discoloured surface of some teeth, while others of the same set, and even some parts of the same teeth, shall be healthy and perfect, the result of some febrile or other morbid condition of the system during their formation. But another and more fertile source of constitutional imperfection in these organs, and one which justifies, more than any other, the common remark that the teeth of the present generation are less healthy and durable than those of their predecessors, is to be found in the free and frequent exhibition of mercury during infancy. It has been a too common practice to administer, in some form or other, this valuable but dangerous medicine, on the most trifling occa-

* "The Teeth a Test of Age," p. 29.

sions, and for the removal of inconsiderable affections, that would readily yield to more mild and salutary treatment. The very flattering and rapid effects of this invaluable remedy obtain frequently so much credit for the medical attendant, that he is tempted to employ it in cases which might be treated, perhaps, with less facility, but with equal certainty, and with less violence to the general health, by far more innocent and simple means. Mercury, if it must be regarded as a specific in the cure of some diseases, has an unquestioned title to be considered a specific in the destruction of the teeth. Its effects on these organs in the adult are sufficiently virulent and unequivocal to warrant a suspicion of its injurious influence during their formation. And it may be fairly questioned, whether any or all of the predisposing or exciting causes of disease in the teeth, have a share in their general and premature destruction equivalent to mercury.

The predisposing causes, then, may be regarded as arising from hereditary predisposi-

tion, infantile diseases, and their remedies, at the head of which stands mercury. And these, by interrupting the formative process, render the structure of the tooth less healthy and perfect, and less capable of resisting the effects of THE EXCITING OR DEVELOPING CAUSES OF DISEASE. These consist in subjecting the teeth to violent and unnatural action and uses, such as cracking nuts, or biting hard substances, employing the teeth as a vice, or forceps, to loosen a screw, the breaking of thread, &c., submitting them to sudden and extreme changes of temperature, exposure to currents of cold air, and other improprieties, which it is unnecessary to detail. Nothing can be more injurious than such treatment, and although no *perceptible* immediate effect may follow, the consequences may be, and frequently are, most injurious. The loss of many a fine tooth, and many an hour of excruciating torture, may be referred to the neglected injury which a previously healthy tooth may have sustained from suddenly encountering a small piece of bone in the

food, or a shot in game. Mechanical injuries, therefore, should be studiously avoided, much less should they be wantonly indulged. But equal care should be taken to prevent sudden and extreme variations in temperature. The consequences of inattention in this respect are scarcely less serious. The very substance of the tooth, although apparently so dense, is permeated by innumerable small vessels, which, on any sudden elevation of temperature, become so distended, that, in an unyielding structure, like that of a tooth, which, unlike the soft parts, admits of no swelling or expansion, results in the death or mortification of the part.* Hence the necessity of the exqui-

* “ The origin of this very general affection has been variously assigned by different authors. Those who hold the view of the inorganic structure of the teeth, ascribe caries to an original malformation of the crowns. Thus caries, in the grinding surfaces of the molares, is said to arise from the depth of the indentations, and the deficiency of enamel in them allowing a lodgment for small particles of food, which there generating chemical action, decompose the substance of the tooth. To such a theory, however, there are some very strong *à priori* and practical objections. In the first place, gentlemen, it can hardly,

site nervous sensibility with which these organs are endowed to give timely intimation when

I think, be supposed, that the Omniscient Architect of the human frame, while succeeding to unbounded admiration in the construction and contrivance of other equally important and more delicate organs, should have failed in these, and that the teeth alone should require a modification in their forms by art. For the principle of the supporters of this dogma is, that the teeth cannot be too smooth, that, in fact, there should be no indentations on them, that those teeth which have an indented surface are inevitably doomed, from their original and natural configuration, to early and certain destruction. Before, however, such an hypothesis can be established, all those cases (which constitute no small proportion of the number of diseased teeth) in which caries commences on perfectly smooth surfaces, and on the anterior surfaces of the incisors or molares, or where it appears to make an election of the salient points, instead of the indentations of the grinding surfaces of the molar teeth, must be got rid of. But this can no more be done, than can the origin of caries be attributed to the natural configuration of the teeth; and the fallacy of a theory which will not apply to one half the phenomena for the explanation of which it is propounded, is apparent. The true origin of caries, as Mr. Bell has observed, appears to be inflammation, which, when it occurs in so dense a structure as the dental bone, might be expected to terminate in the death of the part."—*Extract from the Author's Lectures on the Anatomy, Physiology, and Diseases of the Teeth, delivered at St. Thomas's Hospital.*

the bound of healthful stimulation is about to be overpassed. Thus soups, tea or coffee, or other beverages, should never be taken at a temperature so much above that of the mouth as to produce any sensation of tenderness or thrilling in the teeth. Ices, or very cold liquids, should for similar reasons be avoided, or taken with the precaution of placing them immediately in the centre of the mouth, so as to prevent contact with the teeth.

Such are some of the more obvious and palpable causes of decay in these organs ; to these may be added, the effects of disease, and of the remedies employed for their removal. Stomach complaints, and affections of the liver and digestive organs, exert a material influence upon the health of the teeth ; much mischief, however, also arises from the exhibition of various medicines. These act, either immediately upon the teeth in their passage to the stomach, or through the medium of the circulation. The first consist of acid medicines, which should be taken through a glass tube, and some alkaline powder immediately after applied to the teeth. Amongst

the most prejudicial of the latter class may be mentioned the remedy already alluded to (mereury), which, when administered to salivation, scarcely ever fails to effect the destruction of many or all of these organs, either by exciting decay in the teeth themselves, or absorption of their sockets.

The utmost care and attention should be paid to the teeth during, and immediately after, the exhibition of mereury, by keeping them as free as possible from the tartar, which accumulates in prodigious quantity at such times ; and as soon as the active operation of the medicine has subsided, recourse should be had to the use of the lancet, or leech, to the gums, to relieve the congested state of their vessels. This should not be delayed with the expectation of the tenderness subsiding, for this, with the gentle but effectual removal of the tartar, is the only course to be adopted to allay irritability and to restore healthy action. To wait till this morbid sensibility is subdued, would be to wait till the teeth are irrecoverably lost.

Such, then, are some of the more obvious

and ordinary causes of disease in the teeth ; and since some of them cannot be prevented from coming into operation, even with the utmost care and attention, it becomes of importance to know what is the treatment to be adopted when they shall have fallen into a morbid condition.

When decay has actually appeared in a tooth, however minute it may be, sufficient, perhaps, only to admit the point of a fine probe, or needle, recourse should be had to the operation of stopping. There is not a more injurious error than to defer this until pain is experienced, and this renders a periodical visit to the dentist so desirable, in order that incipient decay may be thus detected in its earliest stage ; for in this operation the chances of success diminish in proportion to the extent of the decay ; so that, while a tooth in which caries has been detected and eradicated in its very earliest appearance, may be rendered as healthy and durable as a perfectly sound one by this operation, in another, which has been neglected until the nerve

is partially or wholly exposed, the result will be more or less doubtful and unsatisfactory. It will not be supposed, however, that this operation is not to be recommended, even in these cases, for teeth may thus often be rendered serviceable for years, which, had they been neglected, would have proved a continued source of pain and uneasiness. Of the substances to be employed for this purpose, gold is unquestionably the best. There are cases, however, in which, from the pressure necessary for its introduction, and from the decayed state of the tooth, it is wholly inapplicable. In such, a preparation of silver, which is introduced with little pressure, and soon hardens into a solid mass, is valuable. It is, however, far inferior to gold, and should never be employed, except in cases in which the latter is wholly impracticable.

It is greatly to be regretted that so many extravagant and unwarrantable representations should be daily placed before the public on this subject, which it is not in the nature of things should be realized. The much-

vaunted *Cements* employed for this purpose, many of which are similar preparations of the baser metals, from their injudicious and universal application, are worse than useless, and only issue in the disappointment of the patient, and, after much increased suffering, in rendering that which, under a different treatment, might have been obviated, an irremediable evil.*

I could instance numerous cases which have come under my own observation—and I am convinced that the practice of every respectable member of the profession would furnish parallels to them—of the frightful consequences of this wholesale and empirical mode of treatment. Intolerable pain, and a degree of inflammation sufficient to endanger surrounding teeth, with abscesses and exfoliations of portions of the maxillary bone, are

* “ Here the caution of the scientific and honourable practitioner, in not holding out the promise of certain success when he knows the result must be more or less doubtful, will be contrasted with the unhesitating boast of the empiric.”—*Bell's Lectures*, p. 142.

by no means uncommon consequences of this ignorant and barbarous quackery.

There are some cases in which, from the shallowness of the cavity, its conspicuous situation, and from a variety of circumstances, of which the dentist only can form an adequate opinion, the use of the file is preferable to the operation of stopping. Such are the majority of those in which caries attacks the teeth situated in the front of the mouth, which, if skilfully managed, may almost invariably be treated in this manner, with more success, and with less detriment to the appearance, than by any other means.

TOOTH-ACHE.

There are probably none of the “ills that flesh is heir to” of so apparently a trivial, yet of so painful a character, as the tooth-ache, and yet there is no malady which is less understood, or the treatment of which is more uncertain. Its symptoms are too acute to be ever forgotten where they have been once experienced, and it is of too general

occurrence to leave many in doubt as to its character and effects; so that a minute description of this affection is quite unnecessary.

To the mind of a poet, all things are suggestive of poetry, and the tooth-ache is not without its ode. Burns has faithfully and graphically described "its gnawing vengeance," and his hearty wish that—

"A' the foes o' Scotland's weal
Might feel a towmond's tooth-ache,"

sufficiently evinces his acquaintance with its enervating effects upon the stoutest heart or most vigorous intellect.

There are at least two distinct species of tooth-ache, arising from totally different causes. One of these, which is most commonly experienced in early life, arises from exposure of the nerves and vessels which are found in the centre of a tooth. The other is the result of inflammation in the membrane which is interposed between the root of a tooth and the bony socket into which it is

inserted. The former is characterized by sharp lancinating paroxysms of pain, the latter by an indolent, dull, aching sensation. A reference to the diagram prefixed to this work will render this distinction—which is a most important one to be observed in the treatment of this malady—more evident than it can be made by a verbal description. It will there be seen that the teeth are united to the maxillary bone by means of their roots, which are inserted into appropriate sockets. To prevent, however, the unpleasant concussion which would occur in mastication, from the contact of bone, no less than to afford means for the nourishment of these parts, a double semi-elastic membrane is interposed, one layer of which pertains to the tooth, and the other to the socket. This membrane, from sudden exposure of the mouth to cold air, and from a variety of circumstances, is liable to inflammation, and when it is in that state requires a course of treatment the very reverse of that which would be

proper in the other case. When the tooth-ache arises from this cause, the following will be some of the symptoms:—

The surrounding gums partaking of the inflammation will be somewhat thickened and tender, the tooth will be slightly ejected from the socket, so that on closing the mouth it will encounter the lower teeth sooner than its neighbours;* it feels somewhat larger and longer, and is more than usually sensible to pressure; along with this there is a constant dull, aching pain, which is increased on becoming warm, or retiring to rest. A tooth-ache of this character would only be exacerbated by stimulating tinctures, and the usual remedies. The treatment to be adopted will consist of warm fomentations, or embrocations, as the camphor liniment, applied to the face, combined with a little aperient medicine, and, if convenient, the use of the warm bath, or, if the symptoms are urgent, the application of

* This is accompanied with a sensation of looseness, and is particularly observable on waking in the morning. It is not, however, an invariable symptom.

the lancet or leech to the gum. The latter is preferable, and easily applied with the ordinary mouth leech-glass. This simple treatment, if promptly adopted, will, in almost all cases of this kind, be found effectual, while the application of the ordinary remedies, however valuable they may be under other circumstances, would only have the effect of increasing the pain, and ensuring the loss of the tooth. From such a course arise gum-boils, abscesses, and those troublesome and generally incurable discharges of purulent matter from the necks of the teeth, or from an opening in the gum.

In the other species of tooth-ache the pain is produced by the exposure of the nerve and minute blood-vessels which occupy the cavity in the centre of a tooth, and which may be seen, in the diagram before alluded to, springing off in small branches from the main trunk, and entering at the ends of the roots. This is probably the more common species of tooth-ache, to which young persons are liable, from the higher organization and the more rapid

decomposition of the teeth. The symptoms in this case are far more acute than in the former, coming in sudden and lancinating paroxysms, of excruciating torture while they last, without the slightest previous intimation, or being excited by taking cold water into the mouth, or by the pressure of a particle of food during mastication. Unlike the other case, the tenderness is confined to one particular spot. The whole tooth may be pressed upon, or even struck, without producing any sensation, but the slightest contact of any instrument, or even of the tongue, upon a particular spot, is sufficient to excite the paroxysm. In this case, some stimulating tincture may be gently applied, on a little wool or lint, over the tender spot, and this may be renewed until relief is obtained. Of these, perhaps the simplest and most efficacious is the camphorated spirit, repeatedly applied and constantly retained in the cavity. The piece of wool or lint, however, should be small, so as not to require pressure for its introduction, which, by causing an effusion of the tincture, would

have a tendency to excite inflammation in the gum. Creosote has been of late much employed, and has probably as good a title to be considered a specific in such cases as any of the popular remedies. Nothing can be more injurious than the employment of the mineral acids for this purpose, which, although they may produce a momentary effect of relief, act powerfully upon the tooth, and destroy its substance. Laudanum, and some other of the anodynes, are generally useless, and probably nothing will give relief sooner, or with more certainty, than the repeated application of the remedy before mentioned (camphorated spirit), which, as it is amongst the simplest and most accessible, is also the most efficacious. Both this and the former species of tooth-ache will, however, be materially relieved, by attending to the secretions and the state of the general health. This malady is frequently excited by a derangement of the digestive function, and may be at least mitigated by mild aperient medicines, assisted by the warm bath, and followed by a tonic.

Here, then, are two distinct species of tooth-ache, requiring totally different and opposite kinds of treatment, possessing characters so marked as to be readily recognised, and on observing the distinction between which all the efficacy of the remedial measures depends. It is one which I believe to be of immense importance in the treatment of these affections, and which, if strictly observed, will do much towards relieving the patient under perhaps the most intractable and anomalous class of diseases to which the human frame is liable. It is so simple, that it will readily admit of self-application, and will enable the patient to form a judgment upon his own case, should he be so situated as to be beyond the reach of professional assistance.

There is a painful affection to which the teeth situated in the front of the mouth are more particularly liable, but from which none are, in some cases, exempt, in which great tenderness exists in the neck of the tooth immediately under the gum. This arises from exposure of a portion of the root of the tooth,

the result of absorption of the socket and gum. Occasionally, this is accompanied with a wasting of the substance of the tooth, so that an indentation is perceptible at this part: in such cases recourse must be had to the preservative effect of alcohol, to arrest the softening of the substance of the tooth, to which camphor may be added to allay sensibility. So that, probably, in this case, no better preparation suggests itself than the camphorated spirit, applied on the tooth-brush after the ordinary ablutions of the mouth are completed.

EXTRACTION OF THE TEETH.

This is a measure which should not be resorted to until every other has proved ineffectual; it ought, also, never to be decided upon by the patient's feelings. Frequently, from cold or other causes, a painful sensation will be felt in one tooth, which, after a few hours, will be transferred to another; and if, under the first impulse, the tooth primarily affected should be removed, the patient may

have the mortification of knowing that a tooth has been extracted, which, but for this, might have remained serviceable for years. On this account it is always preferable to rely on an opinion formed from inspection.

It is by no means uncommon for persons to be prevailed upon to have their teeth extracted, even when only slightly decayed, from the fear of their occasioning the decay of others. This is a very mischievous practice, and is entirely founded in error. As long as a tooth can be retained and rendered serviceable, it ought on no account to be removed, as it is only when it becomes painful that it can prove injurious, and the injury will then be confined to itself, and cease on its removal; since on no principle of observation or argument can it be shewn that disease is thus propagated from any one tooth to another.

Are the roots of teeth which have been destroyed by caries to be in all cases removed? or may they be retained without becoming a source of injury and disease? To this no

general answer can be returned. Where they are healthy, and produce no pain or uneasiness, as they tend to preserve the symmetry of the countenance and the position of the adjoining teeth, they may be retained; but whenever they become the sources of irritation and disease, they should unhesitatingly be removed. A similar remark may be made with respect to the management of the teeth in infancy. The teeth of the first, or temporary set, which begin to be cast off at seven years of age, are frequently removed, although they may not be the cause of the slightest inconvenience to the child, from a very erroneous idea that caries will be by them communicated to the new teeth by which they are about to be succeeded. The fact is, however, that the apprehension should be felt for the effects of the remedy, rather than the disease; for the teeth of the second, or adult set, being derived from those of the first, are, to a certain extent, and for a certain period, dependent upon them for their nourishment and support, and there is far more

danger of interrupting their formation, and rendering them imperfect, from their premature and violent separation, than from any propagation of disease.

The old practice of removing teeth when only slightly decayed, or as soon as they become the sources of the most trifling inconvenience, is, happily, now exploded. And this is not the least gratifying proof of the utility of making dental surgery a distinct branch of medical practice, for it will not be denied, that in proportion to the advanced state to which this art is carried will this violent and unnatural operation be less frequently resorted to ; and it yet remains to be proved that the leaden forceps exhibited in the temple of Apollo at Delphi, indicated the timidity and unskilfulness, and not the wisdom and experience, of the ancients.

There is not a more injurious and fallacious notion than that those teeth which are situated at the back part of the mouth, and which exert less *immediate* influence upon the general appearance, are therefore less im-

portant, and may be removed with impunity upon the most inconsiderable occasion. It should always be remembered, that the removal of a tooth produces more or less derangement through the entire series. It is, therefore, of the utmost importance in early life, for the security and preservation of the teeth, that the set should remain entire. When one of these organs is lost, the opposite tooth, losing the stimulus which was afforded by the pressure of its antagonist, becomes elongated and loose. Those in the same row, which are immediately contiguous, approximate each other; and in doing this, lose their original position, presenting themselves, not in a perpendicular, but in an oblique direction. This approximation of the teeth to each other, which seems to be an effort of nature to recover that mutual support which is necessary to their preservation, but which the removal of one tooth is sufficient to destroy, extends gradually through the entire series. Thus one after another, forsaking its original position, becomes weak-

ened or loose, and undue pressure is thrown upon those which remain. These having an amount of duty imposed upon them for which they were neither designed nor adapted, speedily become the sources of much and severe pain, to obtain immunity from which they are soon sacrificed, and the individual is left toothless at a comparatively early age. Thus the teeth should be retained, not only on account of their own individual importance, but on account of the intimate relations in which they stand to the entire set.

THE GROWTH OF TEETH.

It is well known that at about the age of seven years children begin to lose their temporary, and acquire their permanent teeth.

This is a very important period as to its consequences in the after part of life; and parents can scarcely perform a greater service to the persons of their children, than by having their teeth frequently inspected, in

order to correct any irregularity *while it is possible*.

In general, at about the age above-mentioned, the temporary teeth begin to become loose, and to give place to the permanent teeth which are to succeed them. The necessity for this admirable provision will be apparent on observation. On examining the teeth at about this age, it will be seen that a considerable interval has taken place between them, in consequence of the growth and expansion of the face, and hence a larger set has become necessary to fill the arch.

The important office which these organs are destined to perform, required that they should be composed of a substance too dense and of too low an organization to allow of any subsequent growth or enlargement. Thus the size of the teeth is determined and acquired before they make their appearance through the gums. But teeth which would be of appropriate size in the mouth of an infant would be quite inadequate to the enlarged dimensions of the adult. Hence the

necessity of a second set, exceeding in number and size the teeth of the first, which succeed to their places as the countenance becomes developed, and exchanges the roundness and plumpness of infancy for the more elongated and elliptical form of the adult. Here, then, is a most beautiful provision for a special requirement ; and in no part of the human frame could a more interesting and striking instance of design and contrivance be found than is exhibited in this. The manner and order in which this change takes place have a strict and obvious reference to the comfort of the individual. The removal of the first teeth is facilitated and rendered painless by the absorption of their roots, and their successors are thus enabled to make a considerable advancement before this occurs. The first teeth of the second, or adult set, which make their appearance, are the first molar, or large double teeth, which may be seen emerging from the gum immediately behind the last of the temporary set. Soon after this the two central incisores, or front teeth of the lower

row, are cast off, and succeeded by two others of similar character and form, but of larger size. Shortly after, this change occurs in the two corresponding teeth of the upper row. This is followed by a similar succession in the teeth immediately adjoining these; then, omitting the next in the series, the double teeth of the first set are exchanged for their smaller successors of the second. The cuspid, or eye-teeth, now begin to make their appearance, and generally occasion much anxiety in the mind of the parent from the prominent position in which they present themselves. In a vast majority of cases, however, nothing but time is required to reduce them to their proper station. The subsequent expansion and growth of the bones of the face is very commonly overlooked, and teeth are sacrificed under the impression that there cannot be sufficient space for these to arrange themselves with regularity. I have seen more than a few cases in which, from the premature removal of the small double tooth, which is generally

the selected victim in such circumstances, there has been, from the growth of the maxillary bones, a permanent vacancy sufficient for the insertion of the absent tooth. Nature has not been so lavish in the formation of these important organs that they may be sacrificed in this hasty and inconsiderate manner. Such premature and precipitate measures are most injurious, and are themselves the cause of evils far more serious than those they are intended to remove. Treatment so violent should never be adopted until at least a year after the teeth have made their appearance,—until, in fact, all probability of their ultimately assuming their proper position has disappeared. After these, the second molar, or double teeth, begin to emerge from the gum, making in all twenty-eight teeth, and occupying in their development from seven to fourteen years of age. The next seven years are occupied in the evolution of, lastly, the wisdom teeth, which complete the adult set of thirty-two. The following table will explain this process, and the order in which it occurs :—

AGE.	INCISOR.		CUSPID.	BICUSPID.		MOLAR.		
	Central.	Lateral.		Anterior	Posterior	First.	Second.	Third.
Seven years						4		
Eight	4					4		
Nine.....	4	4				4		
Ten	4	4		4		4		
Eleven	4	4		4	4	4		
Twelve to twelve and a half	4	4	4	4	4	4		
Twelve and a half to fourteen.....	4	4	4	4	4	4	4	
Fourteen to twenty- one	4	4	4	4	4	4	4	4

As might be expected, however, this process does not always occur in the exact order here set down; deviations occasionally present themselves, both of premature and retarded development. This irregularity I believe to be much less than has been generally supposed. It has not unfrequently been stated, that the deviations are so numerous as to render it impossible to fix with precision the time at which any particular class of teeth may be expected to make its appearance. Such a view, however, would not be suggested by a consideration of the anatomy and physiology of these organs, nor will it be substantiated by accurate observation. On the contrary, as I have elsewhere shewn,* the development of the teeth is subject to less interruption, and occurs with more constancy than that of any other part of the animal economy.

There is a prevailing idea, that nature is

* "The Teeth a Test of Age, considered with reference to the Factory Children; addressed to the Members of both Houses of Parliament."

inadequate to the proper conduct of this process; and, under the pretext of preventing irregularity, children are subjected to much unnecessary pain by the premature removal of the temporary teeth, and thus the very evil is often incurred which it was intended to avoid; for the loss of the teeth, whether occurring in infancy or in the more advanced periods of life, is invariably followed by a contraction of the dental arch, so that to remove the temporary teeth before their successors are ready to supply their places, except in some rare instances in which this is absolutely necessary, is the direct method to ensure permanent irregularity.

The position in which the permanent teeth present themselves is much less influenced by the temporary teeth than is generally supposed; and unless the latter offer a positive obstruction to their progress, their extraction is an unwarrantable interference with the economy and purposes of nature. A frequent inspection of the mouth, however, throughout the whole of this process, but

especially during its earlier stages, is desirable, in order to assist, while this may be done by the gentlest means, the normal and due development of these organs.

The facility with which the most decided malformations of the mouth may be reduced by the simplest mechanical contrivance, accurately adapted to the necessities of the case, is such as to excite the utmost surprise and astonishment in those who are not familiar with the subject. I may mention the case of a little girl who was placed under my care for the remedy of that conformation of the mouth* in which the upper teeth are included within the lower. She was the youngest of a large and fine family, in several members of which the tendency to this arrangement was so strong as to frustrate all attempts at reduction. With the advantage, however, of having my little patient placed at a comparatively early period under my care, I felt no hesitation in promising a speedy and effectual cure of this malforma-

* See page 20.

tion. By means of a small apparatus, consisting of a light gold bar, which was continued over some of the double teeth so as to keep them in the front of the mouth a little apart, and with the utmost attention and co-operation on the part of my little patient and her friends, I had the satisfaction of completely remedying the defect in little more than two months. With a little subsequent attention to other teeth as they became developed, all of which exhibited a strong tendency to this malformation, they have ultimately arranged themselves with perfect symmetry, without the removal of one of the permanent teeth. With a simple apparatus of this kind, which, by a careful adaptation, will occasion little or no inconvenience to the child, almost any irregularity in these organs may be speedily and effectually removed, and thus a defect may, by a little timely attention, be remedied, which, if neglected, would prove a source of continual and serious annoyance through life.

RESTORING LOST TEETH.

This is an art which has partaken of the general advancement which science has recently undergone, and the perfection with which substitutes of this kind are now prepared, could scarcely be suspected by those who are not familiar with the subject. There are no parts of the human structure which are so completely imitated, or the uses and functions of which can be so perfectly supplied, as the Teeth. In the artificial preparations of these organs, the three important uses of the teeth pointed out in the commencement of this work are completely restored, the depth and fulness of the countenance are maintained, articulation is rendered perfect and distinct, and mastication is efficiently and easily performed.

As it can scarcely be supposed that any persons can object, from a mistaken view of their utility and importance, to avail themselves of what is so conducive to personal comfort, necessary to health, or due to the

requirements of society, as a resort to the assistance of art in the restoration of these organs, when that shall have become requisite, arguments on this subject will be quite unnecessary. It is sufficiently obvious, that if the *preservation* of the teeth, or indeed of the health in general, is a legitimate object of concern and solicitude, there can be nothing of vanity or impropriety in their *restoration*. To persist in a rejection of the assistance of art in such cases, is practically to deny the value and importance of the teeth, and to refuse to them that high rank and station which they are so evidently destined to fulfil in the animal economy. Medical men have long perceived their importance to the health, and make the state of the mouth a primary subject of inquiry in cases of chronic indigestion and general debility. But, independently of this, it can scarcely be supposed that any persons could be found willing to present themselves in society with deficiencies of these organs, detrimental alike to appearance and articu-

lation, when the remedy is so simple, painless, and efficient.

The idea of making artificial substitutes of this kind appears to be very ancient. The Egyptians, Etruscans, and some other nations, made the loss of a tooth a penalty for some offences; and hence it became an object of great anxiety with any one who had the misfortune to lose one of these organs, in any manner, to have it replaced, without which, indeed, he would hold at least an equivocal rank in society. Thus a great inducement was offered to ingenious artists to turn their attention to this subject.

The Roman ladies appear to have set a high value upon their teeth; but their artificial substitutes were of a very frail kind, being generally composed of white wax, and moulded for every occasion. In a warm assembly, however, or under any very great excitement, these preparations would become sadly attenuated, and sometimes entirely disappear.

It is highly probable, that at no previous

period of the world's history has this art been better understood, or more generally and successfully practised, than at the present. Such, indeed, is the perfection to which it has been advanced, that scarcely a single case could be found, in which, if skilfully attended to, it may not be applied with the best results; and the comfort they are capable of affording when adapted to the peculiarities of the case, and not constructed according to certain routine principles of practice, can only be estimated by those who have had some experience on the subject.*

* An experiment has been lately made of manufacturing preparations of this kind, in a sort of wholesale way, at a cheap rate, like Birmingham jewellery, on the principle of a large demand and quick return. It is quite obvious, however, that, from the very nature of things, such an experiment upon public confidence must issue, as it has done, in the disappointment and vexation of the patient. On such principles, even supposing the individual to be well qualified for his profession, it is quite impossible that each case can be made a study, as it must be, in order that the best results may be obtained, much less that the construction and adaptation, or *material*, can be such as to render comfort and satisfaction to the patient. When the infinite diversity of form which the mouth assumes in different

Much has been said of the superiority of one mode to another, of which it would be impossible to admit the propriety as a general rule. Thus some dentists affect gold, others ivory; some exclusively employ the artificial or mineral preparations, others only natural teeth. Different cases, however, require different treatment, and the skill of the dentist will be much better employed in considering the peculiarities of each case, and adopting such means as are best calculated to afford ease and comfort, than in pertinaciously adhering to any particular method.

It is well known that the method generally adopted in this country for supplying artificial teeth, consists in the accurate adaptation of a plate of ivory or gold to the gum, which is fitted to all its inequalities, so as to diminish the pressure, by dispersing it over a large surface. If there are any remaining teeth,

individuals is considered, (which is so great, that what is adapted to one is totally unfit for any other,) it will immediately be seen, that to whatever arts such a principle may be ultimately applied, it must utterly fail in this.

this plate is continued round their inner surfaces, by which it is more effectually secured in its situation. To this plate, then, the teeth which are to be supplied are attached, their size, position, colour, &c., being determined by the general conformation of the mouth.

In the introductory observations on the value and importance of these organs, the absorption of the sockets, in which the teeth are inserted, was pointed out as effecting a very material change in the aspect and expression of the countenance. This absorption, or loss of substance, however, does not take place with uniform constancy and regularity. Occasionally it extends considerably beyond the original sockets of the teeth, but it not unfrequently falls short of this. To ascertain the extent of this absorption, then, is a point of considerable importance in the supply of artificial teeth. If it has been considerable, an artificial gum must be restored with the teeth, and in this case, ivory will be preferred to gold. With this substance, from its being specifically lighter than gold, any degree of

fulness of the lips or cheek may be obtained without inconvenience. Cases are not unfrequently met with, in which unequal absorption has occurred, so that the mouth is more protuberant on one side than the other; in such, the ivory of itself, or mounted on gold, offers all that could be desired.

One of the earliest cases that fell under my treatment presented the most remarkable instance of this inequality of absorption that probably ever occurred. The fulness required on one side of the mouth exceeded half-an-inch of projection, to render it of equal expansion with the other, in which the teeth were still retained. This, however, was not a purely natural phenomenon, but had been occasioned by the unequal pressure of ill-adapted artificial teeth. This gentleman had for some time placed himself under the care of a dentist of considerable celebrity, but whose adherence to gold prevented him attaining that success in the treatment of this case which was satisfactory either to himself or his patient. Under these circumstances he applied for my

opinion, complaining of great inconvenience, both in mastication and articulation, as well as deformity of the countenance, which was still unremedied. I had no hesitation in recommending at once the substitution of an ivory for the gold base, by which any degree of fulness might be obtained, without materially increasing the weight, or in any way distressing the mouth. The result was strikingly successful; the symmetry of the countenance was restored; the articulation perfected; in fact, everything that could be desired was accomplished, and the same plan is persevered in, affording the most complete satisfaction and comfort, to the present time.

The only possible inconvenience which can arise from the use of ivory is the odour which it acquires from the action of the saliva, or of fluids which are taken into the mouth. This is completely remedied by the immersion of the teeth in spirits of wine during the night. Before, however, being submitted to the action of the alcohol, they should be carefully brushed, to prevent the discolouration which

is sometimes observable after this process, but which may always be removed by the use of a little finely-powdered cuttle fish.

In all cases, then, in which extensive absorption has occurred, and in which considerable fulness is required, ivory is to be preferred. But are there no other circumstances in which it offers superior advantages to gold? Undoubtedly there are. Ivory is of a softer and more congenial nature with the structure of the mouth than gold; and therefore, to persons advanced in life, or of irritable or debilitated constitution, it is invaluable, because, whatever may be the condition of the general health, if carefully adapted, it may be worn, not only without pain, but with much comfort and advantage. Where the constitution is so debilitated by severe or protracted illness that the patient is utterly unable to submit to the extraction of the roots of teeth, which may be a continual source of pain and annoyance, this substance may be accurately fitted over them when nothing else could be borne; and thus the pain may not only be removed, but the uses of the

teeth in some degree restored. One of the most gratifying and striking instances of this is the following :—A lady in the upper ranks of society, who had consulted almost all the eminent members of the profession without any satisfactory result, was at length introduced to me by her daughter, who had previously been my patient. She was quite convinced that her case was a hopeless one, and that, from her advanced age, or some other circumstances, it was impossible that our art could afford her any assistance. Upon inquiry, I found that nothing but gold had been attempted, and it was certainly a case in which, in a younger person, that would have been preferred. I proposed that the experiment should be made in ivory, which was agreed to, and she never ceased to speak of the happiness of the expedient, and to acknowledge the comfort thus afforded her in her declining years.

I had recently an opportunity of demonstrating the value of this material in one of the wards of St. Thomas's hospital. This individual presented a frightful picture of the

devastating effects of disease. The palate, with the greater number of the teeth, had been lost, and the consequences, as might be anticipated, were most distressing. Intelligible articulation was impossible, the countenance was frightfully distorted, and all the painful effects resulting from the loss of the roof of the mouth, allowing a free opening between the latter cavity and the nose, in addition to the ordinary inconveniences arising from the absence of the teeth, were experienced to such a degree as, if not to render life a positive burden, at least to deprive it of its ordinary comforts and enjoyments. Under these circumstances, I was requested by the gentleman under whose care he was admitted,—one of the surgeons to that institution, and distinguished not less for his kindness and humanity of feeling than for his high professional skill and attainments,—to visit him, and endeavour to suggest some alleviation of his sufferings under his present distressing situation. On examination, however, I found that it would be quite impossible to afford

any considerable relief without the restoration of all that had been lost; and this, though attended with much expense, both of time and material, I had no hesitation in undertaking. With some difficulty I succeeded in obtaining a complete cast of the mouth, and having adapted to this a piece of extremely fine ivory, I modelled it so as not only to restore the lost palate and the teeth, but the whole of the maxillary bone which had been lost, completing the floor of the nose, and thus restoring the form and expression of the face.

It need scarcely be observed, that in this case ivory alone could have been employed, and its value was exhibited in a most striking light, in the complete restoration which it effected of the uses of all the parts which had thus been destroyed by disease, to an extent apparently irremediable. The roof of the mouth was rendered entire, and a complete separation maintained between it and the nose. The voice was thus recovered; and considerable attention having been paid to the position and arrangement of the teeth,

articulation was perfect and distinct. The deformity of the countenance, which was very great, arising not only from the loss of the teeth, but of the whole of the fore part of the upper maxillary bone, was completely obviated, and the individual restored to comparative health and comfort. The contrast which this individual presented with and without this apparatus, afforded a sufficiently striking proof of the value of artificial preparations of this kind.

It has been already observed that ivory, on account of its superior softness and congeniality with the structure of the mouth, is greatly to be preferred in cases in which the roots of teeth are retained, and any strong objections are felt to their removal. Not only does this material allow of a more accurate adaptation to their irregular and unequal surfaces, but, when saturated with moisture, it makes a more gentle and elastic pressure than so unyielding a substance as gold. On this account, I believe, it may be employed with the best results, under almost any circum-

stances. When accurately adapted, it will be found not only to excite no uneasiness, but to allay irritability where it already exists.

A popular and distinguished clergyman, at the earnest solicitation of his friends, who perceived with regret his increasingly difficult and imperfect enunciation, was induced to seek the assistance of our art. Excessive nervous irritability, and the fear of exciting those severe neuralgic affections to which he had been for many years more or less subject, prevented his seeking professional aid until nearly the whole of the upper row of teeth had been lost. The roots, however, remained, the teeth having been allowed to perish by decay, without any effort at their preservation. Under these circumstances, and having a strong predilection for the mineral teeth mounted on gold, he became my patient. A preparation of this kind was adapted with the utmost care and accuracy of adjustment, and appeared to perform all that could be desired in such substitutes. In the course of a few weeks, however,

neuralgic pains were experienced about the head, at first simulating common head-ache, but becoming gradually more and more severe, until at length their intensity and frequency were such as almost to incapacitate him for any mental exertion. Medical advice was sought, and some of the most eminent of the faculty were consulted without any substantial relief. At length the possibility of the affection being in some way connected with the teeth was hinted, and it was suggested that he should consult his dentist. This he was the more readily inclined to do from having recently referred its origin to what he imagined to be some galvanic action taking place between the gold and the nerves of the teeth. On examination, however, I found it easily explicable upon the principles of ordinary inflammation, excited and kept up by the pressure of the gold upon the already irritable roots with which the part was so thickly studded. Strong objections being felt to the removal of these, the only course to be pursued appeared to be the

substitution of ivory for the gold. This was accordingly done, and the result was strikingly successful. This gentleman has repeatedly assured me that he has never felt the slightest uneasiness since the adoption of this plan, and he is now able to refer to the experience of several years.

These, and numerous other cases which might be cited, amply confirm the observation already made, that ivory may be worn with comfort and advantage under almost any circumstances, and where other preparations, however well adapted, would be wholly inapplicable. In all these cases a rigid adherence to any one method would have deprived the individual of the advantages and comfort our art is capable of affording. Nothing new was introduced. Success followed the proper application of known principles, from a consideration of the peculiarities of the individual case. Numerous instances of a similar nature might be mentioned, but sufficient probably has been said to shew all that was intended to be shewn,—that wherever

gold excites irritation, and fails to afford that comfort which substitutes of this kind are calculated to impart, ivory should be employed.

There are many and cogent reasons, however, for giving a preference to the former wherever it is available. Ivory undergoes a slow process of decomposition, and without the utmost care and attention imparts more or less fetor to the breath. Gold is not acted upon in this manner, and acquires no taint. In cases in which little absorption has taken place, it is desirable, in order to preserve distinct articulation, that whatever serves as a base to which the teeth are attached, should occupy as small a space as possible. Ivory, if rendered very light and thin, becomes speedily destroyed. Gold may be employed extremely thin and of small size, and yet not be liable to fracture or decomposition. For these reasons, gold will ever continue to be preferred in a vast number of cases in which these organs are artificially supplied.

Much has been said, of late, respecting the comparative merits of the natural and mineral

teeth. The former have been long and extensively employed, and will ever be held in high and general estimation. Persons of extreme sensibility have occasionally, at a first glance at the subject, felt some repugnance to their employment. This, however, is a totally groundless objection. They are to be regarded in every respect as pieces of ivory. The structure, formation, and physiological history of both are identical; and all the objections which can be urged against their use lie also, and with equal force, against the employment of ivory in general, the difference being simply this, that the former are produced in the human frame, the latter in that of the inferior animals. Where, however, such objections are felt, the mineral teeth are highly advantageous. They are composed of a combination of the china paste with some silicious substances which renders them exceedingly hard, and being covered with an enamel which admits of every variety of shade they become a very perfect resemblance to the natural organs. They undergo no decomposition, and their colour remains

unaltered; but they are sometimes liable, especially when of inferior quality, to sudden fracture, according to their position and the manner in which they encounter the antagonist teeth. They have, however, been recently much improved, and, when carefully mounted, are much less liable to this accident than formerly. Like the natural teeth, they are adapted only for the front of the mouth, ivory being on many accounts preferable for the double teeth.

There is another mode of supplying these organs, which, however, is applicable only to the six teeth situated in the anterior part of the mouth, which consists in affixing a new crown to the root of a tooth which has been destroyed by caries. When successfully performed, this is unquestionably the most beautiful and perfect operation which comes within the range of the dentist's practice. It is one, however, which of all others most severely tests his skill; and probably to this circumstance may be attributed the comparatively few cases in which it is attempted.

There are scarcely any circumstances under which a deficiency of these organs may not be repaired with the best results. When one tooth is lost, those on either side speedily lose their original positions, and are in danger of being sacrificed, either by decay or a gradual loosening of their attachments. Again, if one or more of these organs is lost in one row, the corresponding teeth elongate and become loose. The only course to be adopted to prevent these effects is, to restore these organs *as they become lost*, and thus seek to preserve those which remain.

The advantages of a recourse to these preparations are sometimes gradual and almost imperceptible, but they are not therefore the less real and substantial. The appearance of juvenility, joyousness, and health, which an individual presents who has availed himself of the assistance of art in this respect, offers a striking contrast to one who has lived in the neglect of it. The former realizes a comparative re-juvenescence, the latter a premature old age.

There is a prevailing idea that the restoration of the teeth is necessarily attended with pain. Nothing can be more erroneous than such a notion. When skilfully performed, all operations connected with these organs, with the single exception of extraction, are unattended with pain, and should never be persevered in when they occasion the slightest uneasiness. The process of restoring lost teeth is, however, one which, of all others, by skilful management, and the exercise of a little ingenuity, admits of being performed without exciting the slightest pain or inconvenience.

Casts and preparations of the Cases referred to, and others, as well as Models illustrative of the various methods of Restoring lost Teeth, I shall feel happy to exhibit and explain to any persons who may feel interested in the subject.

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